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S/N 10/073,670

PATENTIN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	CHRISTENSEN ET AL.	Examiner:	RIES, LAURIE A.
Serial No.:	10/073,670	Group Art Unit:	2176
Filed:	FEBRUARY 11, 2002	Docket No.:	50037.94USU1
Conf. No.:	4585	Customer No.:	27488
Title:	SYSTEM AND METHOD FOR DISCOVERING INFORMATION ABOUT WEB RESOURCES		

CERTIFICATE UNDER 37 CFR 1.6(d): I hereby certify that this correspondence is being sent via facsimile to (703) 872-9306, Mail Stop Amendment, Commissioner for Patents, Attn: Examiner Laurie Ann Ries, P.O. Box 1450, Alexandria, VA 22313-1450 on 12/04/06

By:

Name: Tracy Gutscher

DECLARATION UNDER 37 C.F.R. § 1.132

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Madam:

We, Erik Christensen, Andrew Layman, and Henrik Frystyk Nielsen, do declare and say as follows:

1. We are co-inventors of the subject matter recited in the claims of the present application (U.S. Patent Application Serial No. 10/073,670).
2. We have reviewed the Office Action dated August 4, 2006 relating to the present application. Our understanding is that the Examiner has cited "Draft: Discovery of Web Services (DISCO)" (the "DISCO Document") against the present application under 35 U.S.C. § 102(a) and 35 U.S.C. 103(a). We have further read the DISCO Document.
3. The DISCO Document was published in July 2000 on <http://msdn.microsoft.com>, which is the Microsoft developer network. The subject matter of the DISCO Document was derived from us.

4. The present application is based on an earlier provisional application filed on February 9, 2001, which is within one year of publication of the Draft DISCO Document.

5. Appendix A includes a final version of the DISCO document. The subject matter of the final version of the DISCO Document was derived from us.

6. Appendix B includes an email thread dated July 7, 2000. The email thread includes inventor comments for suggested revisions to the DISCO Document. The email thread also includes a link to an internally updated version of the DISCO Document associated with the <http://magnet/disco/disco.htm> link of the email thread dated July 7, 2000.

7. Appendix C includes a printout of the internally updated version of the DISCO Document associated with the <http://magnet/disco/disco.htm> link of the email thread dated July 7, 2000.

8. The subject matter of the internally updated version of the DISCO Document associated with the <http://magnet/disco/disco.htm> link of the email thread dated July 7, 2000 was derived from us.


9. Appendix D is a printout of the source code of the internally updated version of the DISCO Document associated with the <http://magnet/disco/disco.htm> link of the email thread dated July 7, 2000. Page 1 of the source code identifies the author as ">erik<." The alias "erik" is the internal Microsoft alias for Erik Christensen.

10. We further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and the like are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

Date: Oct 24, 2006


Erik Christensen

Date: OCT 24, 2006


Andrew Layman

Date: OCT 24, 2006


Henrik Frystyk Nielsen

APPENDIX A

Discovery of Web Services (DISCO)

Early Draft, 06 July 2000

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Introduction

Web Services are described in one or more related documents using the SOAP Contract Language (SCL). This document proposes how SCL documents can be retrieved for a resource or collection of resources, e.g. how information about a service is **discovered**. Note that this discovery algorithm it is not limited to discovering information about web services; it can be used to find metadata about any resource.

There are other existing mechanisms for discovery (DAV, RDF, ...) that are just as valid for discovering services. This document does not attempt to be an exhaustive list but instead proposes two lightweight mechanisms that are likely to work with existing infrastructure.

Notational Conventions

The keywords "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC-2119 [2].

The namespace prefixes "disco", "scl", "schema" and "soap" used in this document are associated with the DISCO namespaces "http://schemas.xmlsoap.org/disco/", "http://schemas.xmlsoap.org/disco/scl/", "http://schemas.xmlsoap.org/disco/schema/" and "http://schemas.xmlsoap.org/disco/soap/".

Status

This draft represents the current thinking with regard to discovery of services within Microsoft. It is published by Microsoft for the purpose of informing interested parties of the current state of that thinking, not as a finished proposal or commitment to implement. Microsoft will not allow early implementation to constrain its ability to make changes to this specification prior to final release.

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- 1. Discovery Algorithm
- 2. Discovery Document Format
- 3. SCL and discovery
 - 3.1 contractRef
- 4. Schemas and discovery
 - 4.1 schemaRef
- 5. SOAP and discovery
 - 5.1 soap

1. Discovery Algorithm

The discovery algorithm is based on the existence of a discovery document format (an XML grammar). A discovery

document is the result of performing discovery on a resource. A discovery document contains links to other resources describing or otherwise related to the resource (Service Contracts, Schemas, etc). A discovery document may refer to related discovery documents. The details of the discovery document format are covered in section 2.

The following algorithm allows a client to retrieve a discovery document given the URL of a resource. The algorithm is independent of what the URL represents. For example, it could be the URL of the site, the URL of a folder within the site, the URL of a particular service within the site, etc.

To obtain the discovery document *D* associated with a URL *U*:

- ❖ Perform an HTTP GET on *U* producing response *R*
- ❖ If the HTTP content-type of *R* is "text/xml":
 - If *R* contains a discovery document, it is the discovery document *D*
 - Otherwise, if there is an xml-stylesheet processing instruction within the content of *R* with at least the following attribute values:
 - type='text/xml'
 - alternate='yes'
 - href='U2'
 Then
 - Perform an HTTP GET on *U2* producing response *R2*
 - If *R2* contains a discovery document, it is the discovery document *D*
 - Otherwise, there is no discovery document *D* available for *U*
 - Otherwise, there is no discovery document *D* available for *U*
- ❖ If the HTTP content-type of *R* is "text/html":
 - If there is an occurrence of a LINK tag within the content of *R* with at least the following attribute values:
 - type='text/xml'
 - rel='alternate'
 - href='U2'
 Then
 - Perform an HTTP GET on *U2* producing response *R2*
 - If *R2* contains a discovery document, it is the discovery document *D*
 - Otherwise, there is no discovery document *D* available
 - Otherwise, there is no document *D* available for *U*

The following MUST be true in order for an HTTP response to be considered a discovery document:

- ❖ The content-type of the HTTP response is "text/xml".
- ❖ The name of the root XML element conforms to the discovery document format.
- ❖ Either the XML namespace is not specified, or it matches that of the discovery document format.

See <http://www.w3.org/TR/xml-stylesheet/#XML> for more information on the xml-stylesheet processing instruction.
 See <http://www.w3.org/TR/html401/struct/links.html#edef-LINK> for more information on HTML's LINK element.

2. Discovery Document Format

The discovery document format is a container for elements that typically contain links (URLs) to resources that provide discovery information. If the URL's are relative, they are assumed to be relative to the location of the discovery document.

The following example discovery document refers to another discovery document, a Service Contract document, a schema document, and HTML based documentation for the service.

```
<disco:discovery>
  <disco:discoveryRef ref='folder/discovery' />

  <-- elements from other namespaces -->
```

```
</disco:discovery>
```

The schema for the discovery document is neutral as to what types of things are being discovered. It relies on elements from other namespaces to provide the actual linking mechanisms specific to a resource type or category.

The only linking element defined intrinsically is **discoveryRef**, which refers to another discovery document. The value of the **ref** attribute is the URL of the discovery document.

Discovery documents may include the XML namespace "http://schemas.xmlsoap.org/disco/" for the **discovery** tag. Programs processing these documents **MUST** read and understand the namespace and **SHOULD** reject documents where the namespace is present and different.

Programs processing discovery documents **SHOULD** ignore any unrecognized elements under the **discovery** tag to allow extensibility of the format.

A discovery document **MAY** have an XML style sheet processing instruction.

3. SCL and discovery

The following elements are defined by the XML namespace "http://schemas.xmlsoap.org/disco/scl/" for use within discovery documents.

3.1 contractRef

The **contractRef** element refers to service defined using the SOAP Contract Language (SCL). The value of the **ref** attribute is the URL of the document. The value of the optional **docRef** attribute is the URL to human readable documentation for the service.

The following example refers to two service contracts:

```
<disco:discovery>
  <scl:contractRef ref='my1.sdl'>
  <scl:contractRef ref='my2.sdl' docRef='my.htm'>
</disco:discovery>
```

4. Schemas and discovery

The following elements are defined by the XML namespace "http://schemas.xmlsoap.org/disco/schema/" for use within discovery documents.

4.1 schemaRef

The **schemaRef** element refers to an XML schema. The value of the **ref** attribute is the URL of the schema. The optional **targetNamespace** attribute indicates the namespace of the schema.

The following example refers to two schemas:

```
<disco:discovery>
  <schema:schemaRef ref='my1.xsd' targetNamespace='http://my.org/my1.xsd' />
  <schema:schemaRef ref='my2.xsd' />
</disco:discovery>
```

5. SOAP and discovery

The following elements are defined by the XML namespace "http://schemas.xmlsoap.org/disco/soap/" for use within discovery documents.

5.1 soap

The **soap** element specifies the location of a soap service with a particular soap **binding** that has been defined in a SCL document. The **binding** attribute contains a QName value. The URI portion of the QName refers to the targetNamespace of a SCL document. The name portion of the QName refers to a **binding** within that SCL document. The value of the **address** attribute is the URL of the soap service.

The following example provides information about two web services:

```
<disco:discovery>
  <soap:soap binding='myl:binding1' address='my1'>
  <soap:soap binding='myl:binding2' address='my1'>
  <soap:soap binding='myl:binding1' address='my2'>
</disco:discovery>
```

Although this information is available by reading a SCL document, this lightweight mechanism allows easier processing by clients attempting to find the location of a service with a known binding.

APPENDIX B

From: Erik Christensen (FX) [erikc@microsoft.com]
Sent: Friday, July 07, 2000 4:21 PM
To: John Shewchuk; Andrew Layman; Charles Fitzgerald; John Montgomery
Cc: Sara Williams
Subject: RE: Before printing the Disco spec ErikC wants to do a couple of quick edits...

okay, one more time. updated version on <http://magnet/disco/disco.htm> and attached.

-erik
<<disco.css>> <<disco.htm>>

-----Original Message-----

From: John Shewchuk
Sent: Friday, July 07, 2000 3:42 PM
To: Andrew Layman; Charles Fitzgerald; John Montgomery
Cc: Erik Christensen (FX); Sara Williams
Subject: RE: Before printing the Disco spec ErikC wants to do a couple of quick edits...

Sorry typo. SOAP Contract Language is correct. Long couple of days ;-)

-----Original Message-----

From: Andrew Layman
Sent: Friday, July 07, 2000 3:37 PM
To: John Shewchuk; Charles Fitzgerald; John Montgomery
Cc: Erik Christensen (FX); Sara Williams
Subject: RE: Before printing the Disco spec ErikC wants to do a couple of quick edits...

Then you need to change the Intro slightly, which says "SOAP Contract Language."

-----Original Message-----

From: John Shewchuk
Sent: Friday, July 07, 2000 3:35 PM
To: Andrew Layman; Charles Fitzgerald; John Montgomery
Cc: Erik Christensen (FX); Sara Williams
Subject: RE: Before printing the Disco spec ErikC wants to do a couple of quick edits...

That is correct.

Just checked with CharlesF and he wants it to be SOAP Control Language.

-John

-----Original Message-----

From: Andrew Layman
Sent: Friday, July 07, 2000 3:06 PM
To: Erik Christensen (FX); John Shewchuk; Sara Williams
Subject: RE: Before printing the Disco spec ErikC wants to do a couple of quick edits...

The Disco doc refers to "Service Description Language (SDL)". I gather this should now be "SOAP Contract Language (SCL)".

-----Original Message-----

From: Erik Christensen (FX)

Sent: Friday, July 07, 2000 3:03 PM
To: Andrew Layman; John Shewchuk; Sara Williams
Subject: RE: Before printing the Disco spec ErikC wants to do a couple of quick edits...

Here is the updated disco spec. I will call Sarah now.

<< File: disco.css >> << File: disco.htm >>
Also on <http://magnet/disco/disco.htm>.

-Erik

-----Original Message-----

From: Andrew Layman
Sent: Friday, July 07, 2000 2:21 PM
To: John Shewchuk; Sara Williams
Cc: Erik Christensen (FX)
Subject: RE: Before printing the Disco spec ErikC wants to do a couple of quick edits...

Sara called me and said her mail is not working, best to phone her.

-----Original Message-----

From: John Shewchuk
Sent: Friday, July 07, 2000 2:17 PM
To: Sara Williams
Cc: Andrew Layman; Erik Christensen (FX)
Subject: Before printing the Disco spec ErikC wants to do a couple of quick edits...
Importance: High

APPENDIX C

document is the result of performing discovery on a resource. A discovery document contains links to other resources describing or otherwise related to the resource (Service Contracts, Schemas, etc). A discovery document may refer to related discovery documents. The details of the discovery document format are covered in section 2.

The following algorithm allows a client to retrieve a discovery document given the URL of a resource. The algorithm is independent of what the URL represents. For example, it could be the URL of the site, the URL of a folder within the site, the URL of a particular service within the site, etc.

To obtain the discovery document *D* associated with a URL *U*:

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- ❖ If the HTTP content-type of *R* is "text/xml":
 - If *R* contains a discovery document, it is the discovery document *D*
 - Otherwise, if there is an xml-stylesheet processing instruction within the content of *R* with at least the following attribute values:
 - type='text/xml'
 - alternate='yes'
 - href='U2'
 Then
 - Perform an HTTP GET on *U2* producing response *R2*
 - If *R2* contains a discovery document, it is the discovery document *D*
 - Otherwise, there is no discovery document *D* available for *U*
 - Otherwise, there is no discovery document *D* available for *U*
- ❖ If the HTTP content-type of *R* is "text/html":
 - If there is an occurrence of a LINK tag within the content of *R* with at least the following attribute values:
 - type='text/xml'
 - rel='alternate'
 - href='U2'
 Then
 - Perform an HTTP GET on *U2* producing response *R2*
 - If *R2* contains a discovery document, it is the discovery document *D*
 - Otherwise, there is no discovery document *D* available
 - Otherwise, there is no document *D* available for *U*

The following MUST be true in order for an HTTP response to be considered a discovery document:

- ❖ The content-type of the HTTP response is "text/xml".
- ❖ The name of the root XML element conforms to the discovery document format.
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See <http://www.w3.org/TR/xml-stylesheet/#XML> for more information on the xml-stylesheet processing instruction.

See <http://www.w3.org/TR/html401/struct/links.html#edef-LINK> for more information on HTML's LINK element.

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The discovery document format is a container for elements that typically contain links (URLs) to resources that provide discovery information. If the URL's are relative, they are assumed to be relative to the location of the discovery document.

The following example discovery document refers to another discovery document, a Service Contract document, a schema document, and HTML based documentation for the service.

```
<disco:discovery>
  <disco:discoveryRef ref='folder/discovery' />

  <-- elements from other namespaces -->
```


The following elements are defined by the XML namespace "http://schemas.xmlsoap.org/disco/soap/" for use within discovery documents.

5.1 soap

The **soap** element specifies the location of a soap service with a particular soap **binding** that has been defined in a SCL document. The **binding** attribute contains a QName value. The URI portion of the QName refers to the targetNamespace of a SCL document. The name portion of the QName refers to a **binding** within that SCL document. The value of the **address** attribute is the URL of the soap service.

The following example provides information about two web services:

```
<disco:discovery>
  <soap:soap binding='my1:binding1' address='my1'>
  <soap:soap binding='my1:binding2' address='my1'>
  <soap:soap binding='my1:binding1' address='my2'>
</disco:discovery>
```

Although this information is available by reading a SCL document, this lightweight mechanism allows easier processing by clients attempting to find the location of a service with a known binding.

APPENDIX D


```

                                disco
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<!-- saved from url=(0026)http://www.w3.org/TR/SOAP/ -->
<html xmlns:v="urn:schemas-microsoft-com:vml"
xmlns:o="urn:schemas-microsoft-com:office:office"
xmlns:w="urn:schemas-microsoft-com:office:word"
xmlns="http://www.w3.org/TR/REC-html40">

<head>
<meta http-equiv=Content-Type content="text/html; charset=iso-8859-1">
<meta name=ProgId content=Word.Document>
<meta name=Generator content="Microsoft Word 9">
<meta name=Originator content="Microsoft Word 9">
<link rel=File-List href="/disco_files/filelist.xml">
<title>Service Contract Language (SCL)</title>
<!--[if gte mso 9]><xml>
  <o:DocumentProperties>
    <o:Author>erikc</o:Author>
    <o:LastAuthor>erikc</o:LastAuthor>
    <o:Revision>27</o:Revision>
    <o:TotalTime>1602</o:TotalTime>
    <o:Created>2000-07-07T21:14:00Z</o:Created>
    <o:LastSaved>2000-07-07T23:20:00Z</o:LastSaved>
    <o:Pages>3</o:Pages>
    <o:Words>1302</o:Words>
    <o:Characters>7424</o:Characters>
    <o:Company>Microsoft Corp.</o:Company>
    <o:Lines>61</o:Lines>
    <o:Paragraphs>14</o:Paragraphs>
    <o:CharactersWithSpaces>9117</o:CharactersWithSpaces>
    <o:Version>9.2720</o:Version>
  </o:DocumentProperties>
</xml><![endif]>--><!--[if gte mso 9]><xml>
  <w:WordDocument>
    <w:DoNotShowRevisions/>
    <w:DoNotPrintRevisions/>
  </w:WordDocument>
</xml><![endif]>-->
<style>
<!--
table.MSONORMAL
    {border-spacing: 1pt
;
}
/* Font Definitions */
@font-face
    {font-family:Wingdings;
panose-1:5 0 0 0 0 0 0 0 0;
mso-font-charset:2;
mso-generic-font-family:auto;
mso-font-pitch:variable;
mso-font-signature:0 268435456 0 0 -2147483648 0;}
/* Style Definitions */
p.MSONormal, li.MSONormal, div.MSONormal
    {mso-style-parent:"";
margin:0in;
margin-bottom:.0001pt;
mso-pagination:widow-orphan;
font-size:12.0pt;
font-family:"Times New Roman";
mso-fareast-font-family:"Times New Roman";}
h1
    {margin-right:0in;
mso-margin-top-alt:auto;
mso-margin-bottom-alt:auto;

```

disco

```
margin-left:.3in;
text-indent:-.3in;
mso-pagination:widow-orphan;
mso-outline-level:1;
mso-list:l1 level1 lfo2;
tab-stops:list .3in;
font-size:24.0pt;
font-family:"Times New Roman";
mso-font-kerning:18.0pt;
font-weight:bold;}
```

h2

```
{margin-right:0in;
mso-margin-top-alt:auto;
mso-margin-bottom-alt:auto;
margin-left:.4in;
text-indent:-.4in;
mso-pagination:widow-orphan;
mso-outline-level:2;
mso-list:l1 level2 lfo2;
tab-stops:list .4in;
font-size:18.0pt;
font-family:"Times New Roman";
font-weight:bold;}
```

h3

```
{margin-right:0in;
mso-margin-top-alt:auto;
mso-margin-bottom-alt:auto;
margin-left:.5in;
text-indent:-.5in;
mso-pagination:widow-orphan;
mso-outline-level:3;
mso-list:l1 level3 lfo2;
tab-stops:list .5in;
font-size:13.5pt;
font-family:"Times New Roman";
font-weight:bold;}
```

h4

```
{margin-right:0in;
mso-margin-top-alt:auto;
mso-margin-bottom-alt:auto;
margin-left:.6in;
text-indent:-.6in;
mso-pagination:widow-orphan;
mso-outline-level:4;
mso-list:l1 level4 lfo2;
tab-stops:list .6in;
font-size:12.0pt;
font-family:"Times New Roman";
font-weight:bold;}
```

h5

```
{mso-style-next:Normal;
margin-top:12.0pt;
margin-right:0in;
margin-bottom:3.0pt;
margin-left:.7in;
text-indent:-.7in;
mso-pagination:widow-orphan;
mso-outline-level:5;
mso-list:l1 level5 lfo2;
tab-stops:list .7in;
font-size:13.0pt;
font-family:"Times New Roman";
font-weight:bold;}
```

Page 2

disco

h6 {mso-style-next:Normal;
margin-top:12.0pt;
margin-right:0in;
margin-bottom:3.0pt;
margin-left:.8in;
text-indent:-.8in;
mso-pagination:widow-orphan;
mso-outline-level:6;
mso-list:l1 level6 lfo2;
tab-stops:list .8in;
font-size:11.0pt;
font-family:"Times New Roman";
font-weight:bold;}

p.MsoHeading7, li.MsoHeading7, div.MsoHeading7 {mso-style-next:Normal;
margin-top:12.0pt;
margin-right:0in;
margin-bottom:3.0pt;
margin-left:.9in;
text-indent:-.9in;
mso-pagination:widow-orphan;
mso-outline-level:7;
mso-list:l1 level7 lfo2;
tab-stops:list .9in;
font-size:12.0pt;
font-family:"Times New Roman";
mso-fareast-font-family:"Times New Roman";}

p.MsoHeading8, li.MsoHeading8, div.MsoHeading8 {mso-style-next:Normal;
margin-top:12.0pt;
margin-right:0in;
margin-bottom:3.0pt;
margin-left:1.0in;
text-indent:-1.0in;
mso-pagination:widow-orphan;
mso-outline-level:8;
mso-list:l1 level8 lfo2;
tab-stops:list 1.0in;
font-size:12.0pt;
font-family:"Times New Roman";
mso-fareast-font-family:"Times New Roman";
font-style:italic;}

p.MsoHeading9, li.MsoHeading9, div.MsoHeading9 {mso-style-next:Normal;
margin-top:12.0pt;
margin-right:0in;
margin-bottom:3.0pt;
margin-left:1.1in;
text-indent:-1.1in;
mso-pagination:widow-orphan;
mso-outline-level:9;
mso-list:l1 level9 lfo2;
tab-stops:list 1.1in;
font-size:11.0pt;
font-family:Arial;
mso-fareast-font-family:"Times New Roman";}

p.MsoToc1, li.MsoToc1, div.MsoToc1 {mso-style-update:auto;
mso-style-next:Normal;
margin:0in;
margin-bottom:.0001pt;

Page 3

disco

mso-pagination:widow-orphan;
tab-stops:9.0pt right dotted 431.5pt;
font-size:10.0pt;
mso-bidi-font-size:12.0pt;
font-family:"Times New Roman";
mso-fareast-font-family:"Times New Roman";
mso-bidi-font-weight:bold;}

p.MsoToc2, li.MsoToc2, div.MsoToc2
{mso-style-update:auto;
mso-style-next:Normal;
margin-top:0in;
margin-right:0in;
margin-bottom:0in;
margin-left:12.25pt;
margin-bottom:.0001pt;
mso-pagination:widow-orphan;
tab-stops:.5in 48.0pt right dotted 431.5pt;
font-size:10.0pt;
mso-bidi-font-size:12.0pt;
font-family:"Times New Roman";
mso-fareast-font-family:"Times New Roman";
mso-bidi-font-style:italic;}

p.MsoToc3, li.MsoToc3, div.MsoToc3
{mso-style-update:auto;
mso-style-next:Normal;
margin-top:0in;
margin-right:0in;
margin-bottom:0in;
margin-left:23.75pt;
margin-bottom:.0001pt;
mso-pagination:widow-orphan;
tab-stops:45.0pt right dotted 431.5pt;
font-size:10.0pt;
mso-bidi-font-size:12.0pt;
font-family:"Times New Roman";
mso-fareast-font-family:"Times New Roman";}

p.MsoToc4, li.MsoToc4, div.MsoToc4
{mso-style-update:auto;
mso-style-next:Normal;
margin-top:0in;
margin-right:0in;
margin-bottom:0in;
margin-left:.5in;
margin-bottom:.0001pt;
mso-pagination:widow-orphan;
font-size:12.0pt;
font-family:"Times New Roman";
mso-fareast-font-family:"Times New Roman";}

p.MsoToc5, li.MsoToc5, div.MsoToc5
{mso-style-update:auto;
mso-style-next:Normal;
margin-top:0in;
margin-right:0in;
margin-bottom:0in;
margin-left:48.0pt;
margin-bottom:.0001pt;
mso-pagination:widow-orphan;
font-size:12.0pt;
font-family:"Times New Roman";
mso-fareast-font-family:"Times New Roman";}

p.MsoToc6, li.MsoToc6, div.MsoToc6
{mso-style-update:auto;
mso-style-next:Normal;

disco

```

margin-top:0in;
margin-right:0in;
margin-bottom:0in;
margin-left:60.0pt;
margin-bottom:.0001pt;
mso-pagination:widow-orphan;
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```

Page 5

```

                                disco
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font-weight:bold;}
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Page 6

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disco

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p.MsoBodyText, li.MsoBodyText, div.MsoBodyText
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 412.2pt 458.0pt 503.8pt 549.6pt 595.4pt 641.2pt 687.0pt 732.8pt;
 font-size:10.0pt;

disco

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 text-align:center;
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                                disco
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mso-footer-margin:.5in;
mso-paper-source:0;}
div.Section1
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/* List Definitions */
@list l0
{mso-list-id:1714227630;
mso-list-template-ids:67698721;}
@list l0:level1
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font-family:Wingdings;}
@list l0:level2
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disco

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text-indent:-.25in;
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@list 10:level5
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font-family:Symbol;}
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text-indent:-1.1in;}

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disco

o1
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u1
 {margin-bottom:0in;}
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<div class=Section1>

<h1 style='margin-left:0in;text-indent:0in;mso-list:none;tab-stops:.5in'>Discovery of Web Services (DISCO)</h1>

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style='mso-bookmark:_Toc487613726'><span
style='mso-bookmark:_Toc487518812'><span
style='mso-bookmark:_Toc487506385'><span
style='mso-bookmark:_Toc487356871'><span
style='mso-bookmark:_Toc487355513'>Early Draft, 06 July
2000
</h2>

<p class=MsonNormal>Copyright© 2000 <ABBR
title=Microsoft>Microsoft</ABBR>,
All rights reserved.</p>

<h1 style='margin-left:0in;text-indent:0in;mso-list:none;tab-stops:.5in'><span
style='mso-bookmark:_Toc487615745'><span
style='mso-bookmark:_Toc487613727'>Introduction</h1>

<p class=MsonNormal>Web Services are described in one or more related documents
using the SOAP Contract Language (SCL).
This document proposes how SCL documents can be retrieved for a resource
or collection of resources, e.g. how information about a service is <b
style='mso-bidi-font-weight:normal'>discovered.<span style="mso-spacerun:
yes"> Note that this discovery algorithm it is not limited to
discovering information about web services; it can be used to find metadata
about any resource.</p>

<p class=MsonNormal><![if !supportEmptyParas]> <![endif]><o:p></o:p></p>

<p class=MsonNormal>There are other existing mechanisms for discovery (DAV, RDF,
…) that are just as valid for discovering services.<span style="mso-spacerun:
yes"> This document does not attempt to be an exhaustive list but
instead proposes two lightweight mechanisms that are likely to work with
existing infrastructure.</p>

<h2 style='margin-left:0in;text-indent:0in;mso-list:none;tab-stops:.5in'><span
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style='mso-bookmark:_Toc487250737'><span
Page 12

disco

name="_Introduction"></h1>

```

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_Toc487621051
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supportFields]><span
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[illegible]

disco
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supportFields]><span
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style='mso-element:field-separator'><![endif]--><span
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</xml><![endif]--><!--[if supportFields]><span style='color:windowtext;
display:none;mso-hide:screen;text-decoration:none;text-underline:none'><span
style='mso-element:field-end'><![endif]--><span
style='font-size:12.0pt;mso-bidi-font-weight:normal'><o:p></o:p></p>
<p class=MsoToc2>4.1<span
style='font-size:12.0pt;color:windowtext;mso-bidi-font-style:normal;text-decoration:
none;text-underline:none'> <span
style='color:windowtext;display:none;mso-hide:screen;text-decoration:none;
text-underline:none'> <!--[if
supportFields]><span
style='color:windowtext;display:none;mso-hide:screen;text-decoration:none;
text-underline:none'><span
style='color:windowtext;display:none;mso-hide:screen;text-decoration:none;
text-underline:none'> PAGEREF _Toc487621062 \h <span style='color:windowtext;
display:none;mso-hide:screen;text-decoration:none;text-underline:none'><span
style='mso-element:field-separator'><![endif]--><span
style='color:windowtext;display:none;mso-hide:screen;text-decoration:none;
text-underline:none'>3<span style='color:windowtext;display:none;
mso-hide:screen;text-decoration:none;text-underline:none'><!--[if gte mso 9]><xml>
<w:data>08D0C9EA79F9BACE118C8200AA004BA90B02000000080000000E0000005F0054006F00630034
00380037003600320031003000360032000000</w:data>
</xml><![endif]--><!--[if supportFields]><span style='color:windowtext;
display:none;mso-hide:screen;text-decoration:none;text-underline:none'><span
style='mso-element:field-end'><![endif]--><span
style='font-size:12.0pt;mso-bidi-font-style:normal'><o:p></o:p></p>
<p class=MsoToc1 style='tab-stops:9.0pt 23.75pt right dotted 431.5pt'><span
class=MsoHyperlink>5.<span style='font-size:12.0pt;
color:windowtext;mso-bidi-font-weight:normal;text-decoration:none;text-underline:
none'> SOAP and discovery<span
style='color:windowtext;display:none;mso-hide:screen;text-decoration:none;
text-underline:none'>. <!--[if
supportFields]><span
style='color:windowtext;display:none;mso-hide:screen;text-decoration:none;
text-underline:none'><span
style='color:windowtext;display:none;mso-hide:screen;text-decoration:none;
text-underline:none'> PAGEREF _Toc487621063 \h <span style='color:windowtext;
display:none;mso-hide:screen;text-decoration:none;text-underline:none'><span
style='mso-element:field-separator'><![endif]--><span
style='color:windowtext;display:none;mso-hide:screen;text-decoration:none;
text-underline:none'>3<span style='color:windowtext;display:none;
mso-hide:screen;text-decoration:none;text-underline:none'><!--[if gte mso 9]><xml>
<w:data>08D0C9EA79F9BACE118C8200AA004BA90B02000000080000000E0000005F0054006F00630034
00380037003600320031003000360033000000</w:data>
</xml><![endif]--><!--[if supportFields]><span style='color:windowtext;
Page 16

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display:none;mso-hide:screen;text-decoration:none;text-underline:none'><![endif]--><o:p></o:p></p>

<p class=MsoToc2>5.1windowtext;mso-bidi-font-style:normal;text-decoration:none;text-underline:none'> <soap>
style='color>windowtext;display:none;mso-hide:screen;text-decoration:none;text-underline:none'>. <!--[if supportFields]><span
style='color>windowtext;display:none;mso-hide:screen;text-decoration:none;text-underline:none'>windowtext;display:none;mso-hide:screen;text-decoration:none;text-underline:none'> PAGeref _Toc487621064 \h windowtext;display:none;mso-hide:screen;text-decoration:none;text-underline:none'><![endif]-->windowtext;display:none;mso-hide:screen;text-decoration:none;text-underline:none'>3windowtext;display:none;mso-hide:screen;text-decoration:none;text-underline:none'><!--[if gte mso 9]><xml>

<w:data>08D0C9EA79F9BACE118C8200AA004BA90B02000000080000000E0000005F0054006F00630034003800370036003200310033000360034000000</w:data>
</xml><![endif]--><!--[if supportFields]>windowtext;display:none;mso-hide:screen;text-decoration:none;text-underline:none'><![endif]--><!--[if supportFields]><![endif]--></p>

<h1><![if !supportLists]>1. <![endif]>Discovery Algorithm</h1>

<p class=MsoNormal>The discovery algorithm is based on the existence of a discovery document format (an XML grammar). A discovery document is the result of performing discovery on a resource. A discovery document contains links to other resources describing or otherwise related to the resource (Service Contracts, Schemas, etc). A discovery document may refer to related discovery documents. The details of the discovery document format are covered in section 2.</p>

<p class=MsoNormal><![if !supportEmptyParas]> <![endif]><o:p></o:p></p>

<p class=MsoNormal>The following algorithm allows a client to retrieve a discovery document given the URL of a resource. The algorithm is independent of what the URL represents. For example, it could be the URL of the site, the URL of a folder within the site, the URL of a particular service within the site, etc.</p>

<p class=MsoNormal><![if !supportEmptyParas]> <![endif]><o:p></o:p></p>

<p class=MsoNormal>To obtain the discovery document <i>D</i> associated with a URL <i>U</i>:</p>

<p class=MsoNormal style='margin-left:.25in;text-indent:-.25in;mso-list:l0 level1 lfo8; tab-stops:list .25in'><![if !supportLists]>v<span

[illegible]

[illegible]

disco
which refers to another discovery document. The value of the **ref** attribute is the URL of the discovery document.

<p class=MSONormal><![if !supportEmptyParas] <![endif]><o:p></o:p></p>

<p class=MSONormal>Discovery documents may include the XML namespace **“http://schemas.xmlsoap.org/disco/”** for the **d<b style='mso-bidi-font-weight: normal'>iscovery** tag. Programs processing these documents **<b style='mso-bidi-font-weight: normal'>MUST ** read and understand the namespace and **SHOULD** reject documents where the namespace is present and different.

<p class=MsoFootnoteText><![if !supportEmptyParas] <![endif]><o:p></o:p></p>

<p class=MSONormal>Programs processing discovery documents **SHOULD** ignore any unrecognized elements under the **<b style='mso-bidi-font-weight: normal'>discovery** tag to allow extensibility of the format.

<p class=MSONormal><![if !supportEmptyParas] <![endif]><o:p></o:p></p>

<p class=MSONormal>A discovery document **MAY **have an XML style sheet processing instruction.

<h1><![if !supportLists]>3. <![endif]>SCL and discovery</h1>

<p class=MSONormal>The following elements are defined by the XML namespace **“http://schemas.xmlsoap.org/disco/scl/”** for use within discovery documents.

<h2><![if !supportLists]>3.1 <![endif]>contractRef</h2>

<p class=MSONormal>The **contractRef **element refers to service defined using the SOAP Contract Language (SCL). The value of the **ref **attribute is the URL of the document. The value of the optional **docRef **attribute is the URL to human readable documentation for the service.

<p class=MSONormal><![if !supportEmptyParas] <![endif]><o:p></o:p></p>

<p class=MSONormal>The following example refers to two service contracts:

<p class=Code></disco:discovery></p>

<p class=Code> </scl:contractRef ref=’my1.sdl’></p>

<p class=Code> </scl:contractRef ref=’my2.sdl’ docRef=’my.htm’></p>

<p class=Code></disco:discovery></p>

<h1><![if !supportLists]>4. <![endif]>Schemas and discovery</h1>

disco

<p class=MSONormal>The following elements are defined by the XML namespace **“http://schemas.xmlsoap.org/disco/schema/”** for use within discovery documents.**</p>**

<h2><![if !supportLists]>4.1 <![endif]>schemaRef</h2>

<p class=MSONormal>The **schemaRef **element refers to an XML schema.** **The value of the **ref **attribute is the URL of the schema.** **The optional **targetNamespace** attribute indicates the namespace of the schema. **</p>**

<p style='margin:0in;margin-bottom:.0001pt'><![if !supportEmptyParas]> <![endif]><o:p></o:p></p>

<p class=MSONormal>The following example refers to two schemas:**</p>**

<p class=Code><disco:discovery></p>

<p class=Code> <schema:schemaRef ref=’my1.xsd’ targetNamespace=’http://my.org/my1.xsd’/></p>

<p class=Code> <schema:schemaRef ref=’my2.xsd’/></p>

<p class=Code></disco:discovery></p>

<h1><![if !supportLists]>5. <![endif]>SOAP and discovery</h1>

<p class=MSONormal>The following elements are defined by the XML namespace **“http://schemas.xmlsoap.org/disco/soap/”** for use within discovery documents.**</p>**

<h2><![if !supportLists]>5.1 <![endif]>soap </h2>

<p class=MSONormal>The **soap **element specifies the location of a soap service with a particular soap **binding** that has been defined in a SCL document.** **The **binding **attribute contains a QName value.** **The URI portion of the QName refers to the targetNamespace of a SCL document.** **The name portion of the QName refers to a **binding **within that SCL document.** **The value of the **address **attribute is the URL of the soap service.**</p>**

<p class=MSONormal><![if !supportEmptyParas]> <![endif]><o:p></o:p></p>

<p class=MSONormal>The following example provides information about two web services:**</p>**

<p class=Code><disco:discovery></p>

<p class=Code> <soap:soap binding=’my1:binding1’ address=’my1’/></p>

<p class=Code> <soap:soap

```
binding=&#8217;my1:binding2&#8217; address=&#8217;my1&#8217;&gt;</p>
                                disco
<p class=Code><span style="mso-spacerun: yes">&nbsp;</span>&lt;soap:soap
binding=&#8217;my1:binding1&#8217; address=&#8217;my2&#8217;&gt;</p>
<p class=Code>&lt;/disco:discovery&gt;</p>
<p class=MsoNormal><![if !supportEmptyParas]>&nbsp;<![endif]><o:p></o:p></p>
<p class=MsoNormal>Although this information is available by reading a SCL
document, this lightweight mechanism allows easier processing by clients
attempting to find the location of a service with a known binding.</p>
</div>
</body>
</html>
```